

Kansas State University

Campus Infrastructure Improvements

12.5kVA Improvements

PROGRAM

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Prepared by Kansas State University Facilities Campus Planning and Project
Management



Introduction

Kansas State University's primary electrical distribution system is comprised of a 4160V system installed in early 1950s and a newer 12.5kVA system. In 2007, the University began a switchover to the 12.5kVA electrical system. The switchover was instituted as the existing 4160V distribution system has no redundancy capabilities and is considered an antiquated system as follows ...

The 4160V system, when installed, reused some of the 1920s electrical infrastructure and switching. The age of the existing 4160V infrastructure system is experiencing failures in the distribution lines leading to building power outages.

The existing 4160V pad mount transformer located along the south side of the Power Plant that provides all the 4160V campus electrical distribution is antiquated and overloaded requiring additional cooling by alternative sources to compensate the overloading of the transformer.

Individual building transformers and distribution equipment either are nearing or have reached the end of the expected useful life.

Equipment parts are difficult to obtain extending downtime/outages when repairs are required or necessitated due to power failure the 4160V distribution system or a portion of the 1460V distribution system.

The switchover to the 12.5kVA system has been occurring as money is available within the University's allocated Repair and Rehabilitation funds from the Board of Regents, typically one to two buildings per year. Currently, 19 Campus buildings are still supplied by the 4160V campus electrical distribution system.

Over the last 18 months, several of buildings on 4160V power have experienced power outages as a result of this antiquated system. The downtime/outages have been disruptive to providing services for students, impacted classroom instruction, and have resulted in unanticipated costs for temporary measures to mitigate downtime.

If the upgrade from the 4160V distribution system to the 12.5kVA distribution system were to continue with one to two buildings per year, this antiquated system would remain for the next 14 years with increased potential for power outages/failures. This proposed project program would complete the design and construction over an approximately 2 year timeframe.

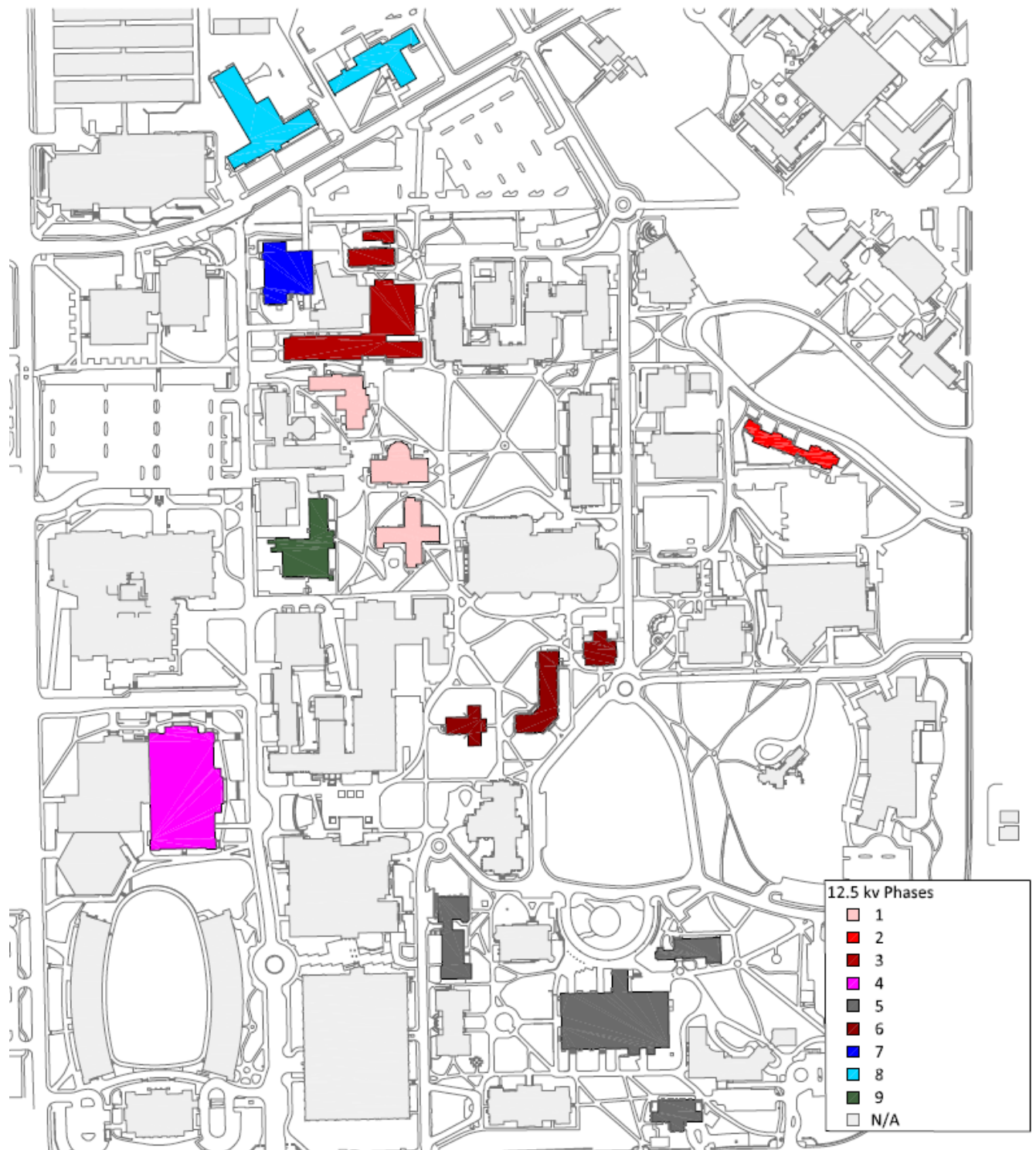
Project Description

The proposed project scope will address removing all remaining buildings from the antiquated 4160V campus electrical distribution system and extend the 12.5kVA medium voltage campus electrical distribution system. Additionally, each building will undergo a service upgrade to include replacement of transformer(s), low voltage service

into the building and replacement of building switchgear. All new work will comply with US DOE 2016 Efficiency Standards and current electrical and building codes.

The work is proposed to be phased to occur on groups of buildings that have been identified as having a greater likelihood of failure/outage of the existing 4160V electrical distribution system. The buildings to be upgraded are illustrated below:

Site Map



Current Conditions & Space Summaries

An evaluation of existing electrical systems, listing of deficiencies and recommendations for the existing distribution system and building improvements was prepared in 2015 by on-call consulting engineer firm Brack & Associates. The University has evaluated potential replacement schedule.

Existing buildings to be upgraded from the 4160V to 12.5kVA and indicated by potential phased replacement include:

Year 1

Phase 1

These projects were designed by existing on-call engineering contracts and can be released to bid upon funding.

Eisenhower Hall / Burt Hall

The remainder of the buildings comprise the rest of this capital project program and will be designed by an engineer obtained through the OFPM capital project process.

Phase 2

Holton Hall / Holtz Hall / Leasure Hall / English Counseling Services / Campus Creek Complex / Cardwell Hall / Bushnell Hall / Bushnell Annex / Ahearn Field House

Year 2

Kedzie Hall / Thompson Hall / Danforth-All Faiths Chapel / McCain Auditorium
Military Science / Umberger Hall / Dykstra Hall / Power Plant

Budget

Estimate of Project Costs	
Design Fees	
(Architect, Engineer, other Consultants including commissioning)	\$550,000
Construction	
(Construction Cost, etc.)	\$5,600,000
Ancillary Contracts	
(Site Survey, Geotechnical Investigation, Construction Testing)	\$200,000
FF&E	
(Furniture, A/V, equipment, etc.)	\$0
Miscellaneous Costs	
(Administrative fees, internal labor, ancillary contracts, etc.)	\$550,000
Contingency	
(10%)	\$900,000
Total	\$7,800,000

Funding

The University intends to seek legislative bonding authorization of \$7.8 million during the 2017 legislative session if the repair and rehabilitation project and financing is approved by the Kansas Board of Regents at the December meeting. Once approved by the legislature, the University will secure short-term financing up to seven years through the Kansas Development Finance Authority. Several investment tools are available through KDFA such as the Pooled Money Investment Board to capitalize on the low cost of issuance as well as historically low interest rates. The University will fund the debt service costs through a portion of the Educational Building Fund annual appropriation and revenue generated from interest deposited in the Deferred Maintenance Support Fund.

Maintenance

Because this project is an infrastructure project no significant increases are expected in operations, maintenance and utility funding.

Timeline/Schedule

Bid Eisenhower and Burt Hall (design was completed by on-call engineering contract and have been waiting on funding) Bid in April 2017 for construction start in May 2017 and complete in September 2017.

For remainder of the buildings -

Obtain Engineering Services – Feb – March 1, 2017

Design for year 1 buildings – March 15, 2017 – June 15, 2017

Bid year 1 buildings – July 30, 2017

Year 1 buildings construction – August 15, 2017 – August 15, 2018

Design year 2 buildings August 15, 2017- Feb 15, 2018

Bid year 2 buildings – April 30, 2018

Construction – May 15, 2018 – June 30, 2019